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Hydrology and Earth System Sciences Discussions

Interactive comment on "Simulation of snow distribution and melt under cloudy conditions in an alpine watershed" *by* H.-Y. Li and J. Wang

Anonymous Referee #1

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The authors present an interesting combination of mass balance and energy balance methods to model snow melt runoff in a alpine watershed in Northwestern China. They combine remote sensing and meteorological, cryospheric and hydrological observation in an innovative way. The topic is very relevant to the readers of HESS and after taking into account the minor revisions below I recommend to accept the paper for publication.

General remarks

1. The authors use R2 as a symbol for the Nash-Sutcliffe criterion. R2 is generally used for the coefficient of determination and this is confusing.

2. P1391, l1. What do the authors mean with snow duration?

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3. SCA and SCF are sometimes mixed up for example on p3193, l12-21

4. Paragraph 2.2 is unnecessarily complex. It only states that on cloudy days SCF is linearly interpolated based on the nearest non-cloudy days. Also was a threshold used if the number of subsequent cloudy days exceeded a certain period?

5. p3195, l5-10. the authors state that runoff is only released if the temperature of the snow pack is raised to the melting point and the snow pack is saturated. It is however not clear how this is taken into account in their modeling approach.

6. p3195, l22. The values of 20 cm for Mini and 0.95 for Cs should be justified.

7. The results and discussion section is very limited and this could be extended to make the paper even more interesting.

Minor remarks

p3190, l18. Do not use "difficult"

p3190, l25. Remove "thus"

p3191, l17-20. Rephrase the paragraph

p3192, l9-13. Rephrase the paragraph

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